Serial Number: 10/612,705

Filing Date: June 30, 2003
Title: METHOD AND APPARATUS FOR FORMING PRINTED CIRCUIT BOARDS USING IMPRINTING AND GRINDING

IN THE CLAIMS

Please amend the claims as follows:

1. - 9. (Canceled)

10. (Original) A system for making a conductive circuit on a substantially non-conductive substrate, the system comprising:

an indenter that forms a plurality of indentations on a major surface of the substrate; a plater that plates conductive material on the major surface of the substrate and within the indentations formed in the major surface of the substrate; and

a grinder that removes a portion of the conductive material plated on the major surface of the substrate leaving conductive material within the indentations in the major surface of the substrate, wherein the conductive material within at least some of the plurality of indentations is separated from the conductive material within some of the other indentations by non-insulative material.

- 11. (Original) The system according to claim 10 wherein the grinder removes a portion of the conductive material within the plurality of indentations.
- 12. (Original) The system according to claim 10 wherein the grinder removes a portion of the conductive material within the plurality of indentations and the conductive material over the non-conductive material between the indentations to form a planar surface including non-conductive material and conductive material.
- 13. (Original) The system according to claim 10 wherein the indenter includes a plate having a negative of the indentations in the substrate.
- 14. (Original) The system of claim 10 wherein the indentations include at least one channel.

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- 15. (Original) The system of claim 10 wherein the indentations include at least one pad.
- 16. (Original) The system of claim 10 wherein the indentations include at least one via.
- 17. (Original) The system of claim 10 wherein the indenter is a roller.
- 18. (Original) The system of claim 17 wherein the roller includes an interchangeable plate having a negative of the indentations in the substrate.
- 19. (Original) The system of claim 10 wherein the indenter includes a plurality of planar surfaces.
- 20. 30. (Canceled)
- 31. (New) The system of claim 10 wherein the grinder further comprises a plurality of grinding elements.
- 32. (New) The system of claim 10 wherein the indenter further comprises a plurality of indenting devices.
- 33. (New) The system of claim 10 wherein the indenter is adapted to form indentations which form an opening in the sheet.
- 34. (New) The system of claim 10 wherein the indenter is adapted to form indentations which form an opening passing through the sheet.
- 35. (New) The system of claim 10 wherein the indenter is adapted to plastically deform a the sheet.
- 36. (New) The system of claim 10 wherein the sheet is formed of non-conductive plastic.

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- 37. (New) The system of claim 10 further comprising a base, the base producing a force that counteracts the indenter.
- 38. (New) The system of claim 10 further comprising:
 - a first load roller; and
- a second load roller, wherein the first load roller and the second load roller are adapted to place a load on the major surface of the sheet and on another surface of the sheet.
- 39. (New) The system according to claim 10 wherein the grinder removes a portion of the conductive material between the plurality of indentations.
- 40. (New) A system for making a conductive circuit on a substantially non-conductive substrate, the system comprising:

an indenter adapted to form a plurality of indentations on a major surface of the substrate; a plater adapted to plate conductive material on the major surface of the substrate and within the indentations formed in the major surface of the substrate; and

a grinder adapted to remove a portion of the conductive material plated on the major surface of the substrate to leave conductive material within the indentations in the major surface of the substrate.

- 41. (New) The system according to claim 40 wherein the grinder is adapted to remove a portion of the conductive material between the plurality of indentations.
- 42. (New) The system according to claim 40 wherein the grinder is adapted to remove a portion of the conductive material within the plurality of indentations.

RESPONSE TO RESTRICTION REQUIREMENT AND PRELIMINARY AMENDMENT

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The system according to claim 40 wherein the grinder is adapted to remove a 43. (New) portion of the conductive material within the plurality of indentations and the conductive material over the non-conductive material between the indentations to form a planar surface including non-conductive material and conductive material.

- The system of claim 40 wherein the indenter is adapted to form indentations 44. (New) which form an opening in the sheet.
- The system of claim 40 wherein the indenter is adapted to form indentations 45. (New) which form an opening passing through the sheet.
- The system of claim 40 wherein the indenter is adapted to plastically deform a the 46. (New) sheet.
- The system of claim 40 wherein the sheet is formed of non-conductive plastic. 47. (New)
- The system of claim 40 wherein in the indenter further comprises: 48. (New) a first roller apparatus adapted to form a plurality of indentations in the substrate; and a second roller apparatus adapted to form a plurality of indentations in the substrate.